



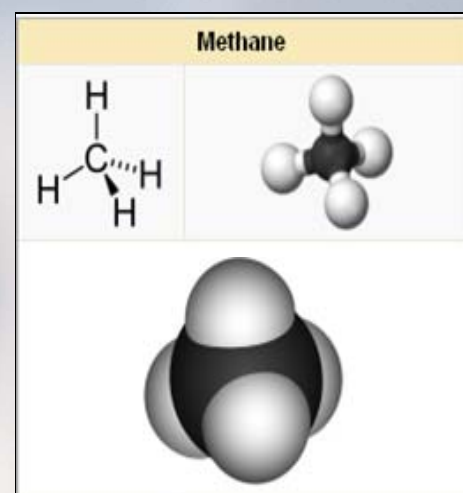
## Trace analysis for C1-C4 Gases in water including Methane.

For many years ALS has provided NATA accredited analyses of water samples for Methane, Ethylene, Ethane, Propylene, Propane, Butylene and Butane. These results have historically been used to monitor natural attenuation of contaminated ground waters and / or industrial and process discharges. With the increasing focus on Greenhouse Gas emissions and Coal Seam Gas, ALS has developed trace determination of the C1-C4 gases in water, with a particular focus on Methane.

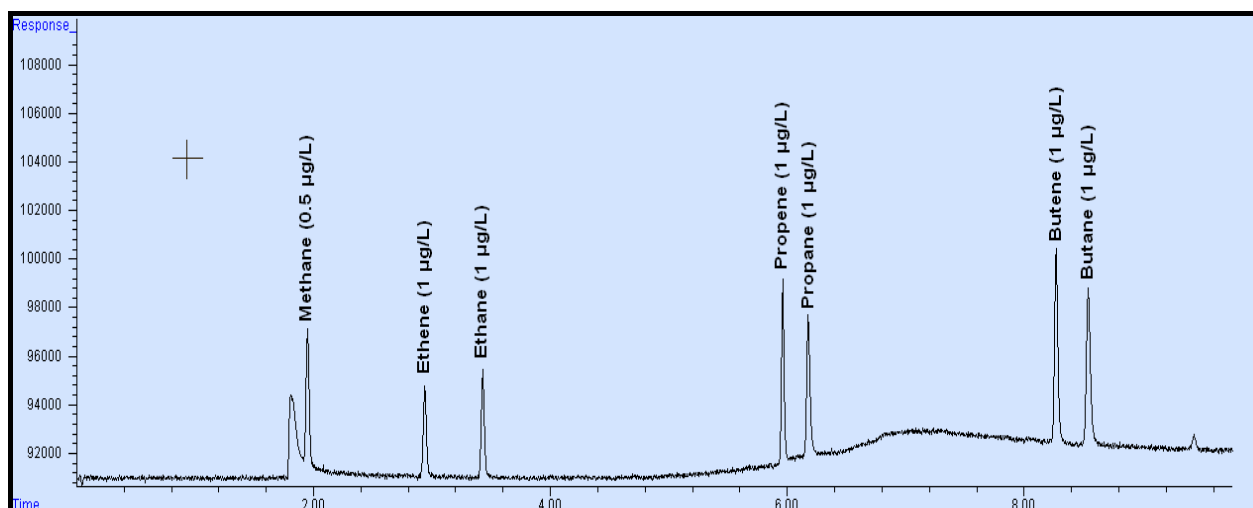
### Methane - What is it and where does it come from? <sup>(1)</sup>

Methane is the simplest alkane, with a chemical formula of CH<sub>4</sub> and is a colorless clean burning gas which makes it an attractive fuel. It has a solubility in water of 35mg/L at 17°C. Methane is the major component of natural gas (approximately 87%) and is a relatively potent Greenhouse Gas with a high global warming potential. Methane in the atmosphere is eventually oxidized producing carbon dioxide and water with a half life of seven years. Methane abundance in the Earth's atmosphere has increased by about 150% since 1750.

While 'natural processes' including wetlands, termites and Oceans contribute 45% of Methane emissions, another 7% are generated by landfills. Other sources include the Energy industry (18%), Livestock (19%), Waste Treatment (4%) and Biomass combustion (7%). Methane is a focus in Australia as a fuel source including coal seam gas and from 'Biogas' – Generated by the fermentation organic matter including manure, wastewater sludge, municipal solid waste and other biodegradable feedstock in anaerobic conditions.



Chromatogram Showing Trace levels of C1-C4 gases in water.



*Right solutions....  
....Right partner*



## LORs Available

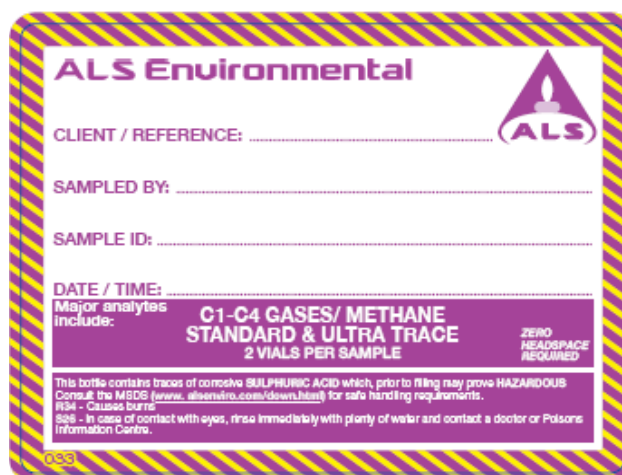
With the majority of the ‘gases’ analyses focused on methane, ALS reports methane (only) unless requested otherwise on the COC. In addition, with two levels of analysis, standard and trace, now available, ALS will default to standard level analysis unless requested otherwise on the COC (by quoting EP-033-LL or Trace analysis). Table 1 shows the reporting LORs available.

Table 1 – ALS Services Available

Analyte	CAS Number	ALS Method Code EP-033	ALS Method Code EP-033-LL
		Standard LOR (µg/L)	New Trace LOR (µg/L)
Methane	74-82-8	10	1
Ethylene (Ethene)	74-85-1	10	1
Ethane	74-84-0	10	1
Propylene (Propene)	115-07-1	10	1
Propane	74-98-6	10	1
Butylene (Butene)	25167-67-3	10	1
Butane	106-97-8	10	1

## General Sampling Requirements

With the development of the new Trace Gases and Methane services, ALS will be moving to vial pairs with a dedicated label specifically for these analytes (see adjacent). The preservation of these vials will also change to using trace levels of Sulphuric Acid, which will mean that samples preserved under these conditions will be suitable for shipment by air under current guidelines. It should be noted however that existing vials will also be appropriate for testing as long as these are provided in addition to any vials submitted for (separate) VOC analysis. It is important to note however that HCl preserved vials of water are not suitable for transport by air except under Dangerous Goods protocols.



As per current ALS protocols, sampling in the field will involve taking duplicate vials, and importantly, these should be provided with zero headspace.

For further information on trace level analysis for methane and gases, please feel free to contact the ALS Technical Manager or your local ALS team.

<sup>(1)</sup> Methane, <http://en.wikipedia.org/wiki/Methane>